## Serigraph Annual Green Tier Report – For Calendar Year 2017

## Facility Summary, Milestones, and Context for Performance Data

**Facility Summary**

Serigraph Inc. is a manufacturer of decorative components for a wide range of OEM customers as well as the Point-of-Purchase advertising industry. Serigraph's environmental ethics extend beyond meeting and exceeding regulated and unregulated edicts. The scope of the Green Tier 2 application is Serigraph's plant 1 and plant 2 facilities, also known as the Industrial Graphics (IG) Division and Specialty Division respectively. Corporate headquarters is located in plant 2.

Opportunities are identified at Serigraph to prevent pollution, minimize the use of raw materials and reduce energy consumption as part of the ISO 14001 process. Efforts are in place to reduce waste at all levels of the organization. Serigraph has shared its sustainability and pollution prevention activities with several organizations in 2017. The quantity of parts produced was down significantly in 2017 from 2016 with a drop of 10.3% in volume. Scrap as a percent of cost was 25% lower in 2017 versus 2016, which has a significant favorable environmental impact since less raw materials and energy are consumed as well as less emissions being generated. Continuous improvement efforts to waste and scrap continue to drive Serigraph's operational efforts.

**Context for Performance Data**

Data collected is for the IG Division and Plant 1 Specialty Division.

**Table 1: Improved Environmental Performance**

| TYPE OF PERFOR-MANCE MEASURE | METRIC (Suggested Units) SigEA=Significant Environmental Aspect) | DATA COLLEC-TION | 2004 (Baseline) | 2014 | 2015 | 2016 | 2017 | 2018 | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| Air emissions (SigEA) | VOCs tons/year | Serigraph | 18.58 | 17.9 | 13.8 | 20.58 | 16.2 | | The ratio is half of baseline year. Humidification chamber being used to control VOCs. |
| | Pounds of VOCs per 10,000 parts produced | IG Division | 6.97 | 3.14 | 2.3 | 3.9 | 3.5 | | |
| | FED HAPs (tons/year) | Serigraph P2 | 12.7 | 9.8 | 6.2 | 4.9 | 5.1 | | HAPs Total tons remains low |
| | Pounds of HAPS per 10,000 parts produced | IG Division | 2.9 | 1.7 | 1.1 | .94 | 1.1 | | |
| Energy use reduction (SigEA) | Electricity (KWh/year) | Serigraph P1 & P2 | 14,635,574 | 12,940,236 | 12,578,007 | 11,840,936 | 11,701,256 | | Serigraph is part of strategic energy management program with Focus on Energy and measures actual kWh usage vs projected based on FOE model and Serigraph saved 1,186 MMBtu's relative to predicted model in 2017 due to energy saving actions |
| | Parts produced per kWh | IG Div | 5.0 | 9.0 | 9.6 | 8.9 | 7.8 | | |
| | Natural gas (Therms/year) | Serigraph P2 | 385,583 | 423,493 | 385,709 | 361,082 | 352,324 | | Serigraph is part of strategic energy management program with Focus on Energy and measures actual kWh usage vs projected based on FOE model and Serigraph saved 1,186 MMBtu's relative to predicted model in 2017 due to energy saving actions |
| | Parts produced per Therm | IG Div | 91.9 | 269.3 | 313.6 | 293.3 | 260.62 | | |
| Non-Hazardous waste | Water based ink waste, UV ink waste, Used oil | Serigraph | 94,963 | 7,826 | 25,202 | 12,413 | 15,150 | | Non-hazardous waste increased due to total pounds of UV ink usage going up |
| Hazardous waste (SigEA) | Hazardous waste (lbs/year) | Serigraph P2 | 83,213 | 13,301 | 13,099 | 13,183 | 13,241 | | Hazardous waste continues to remain low as ratio to parts produced relative to baseline |
| | Haz waste lbs as ratio to 10,000 parts produced | | 14.99 | 1.17 | 1.08 | 1.24 | 1.44 | | |

| TYPE OF PERFOR-MANCE MEASURE | METRIC (Suggested Units) SigEA=Significant Environmental Aspect) | DATA COLLEC-TION | 2004 (Baseline) | 2014 | 2015 | 2016 | 2017 | 2018 | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| Amount of recycling (SigEA) | Polycarbonate-recycled (lbs/year) | Serigraph | 992,291 | 647,906 | 611,843 | 440,657 | 322,098 | | Less scrap and volume = less recycled material |
| | Paper-total recycled (lbs/year) | Serigraph | 968,681 | 597,791 | 644,564 | 712,073 | 698,903 | | |
| | Metals-recycled (lbs/year) | Serigraph | 129,425 | 62,888 | 77,108 | 49,163 | 32,314 | | |
| | Reclaim - Reduce ratio of pounds of solvent used per sq in of mesh used **(Must be <.05)** | Serigraph Plt 2 | .016 | .028 | .023 | .023 | .0228 | | Performance remains strong over past four years |
| | Percentage of Low VOC (<3.3 lbs/gal) ink versus Conventional P1 &P2 | Serigraph P1 and P2 | 52.2% | 63.7% | 60.3% | 70.3% | 78.2% | | Dictated by % of product that is formed and customer designs. Low VOC inks are selected whenever possible |
| | | | | | | | | | |

**Table 2: "Beyond Compliance" Activities and Improved Management Practices**

| TYPE OF PERFOR-MANCE MEASURE | METRIC (Suggested Units) | DATA COLLECTION | 2004 (Baseline) | 2014 | 2015 | 2016 | 2017 | 2018 | NOTES |
|---|---|---|---|---|---|---|---|---|---|
| Commitments to "superior environmental performance" (from Green Tier acceptance letter) | VOC and air toxics emissions reductions | See VOC/HAP measures in Table 1 | See Table 1 | See table 1 | See table 1 | See table 1 | See table 1 | | |
| | Waste minimization, including recycling | See recycling, solid waste, and hazardous waste measures in Table 1 | See Table 1 | See table 1 | See table 1 | See table 1 | See table1 | | |
| | Minimizing solvent usage for Parts cleaning (lbs per year) | Serigraph P2 | 4,336 | 410 | 0 | 0 | 0 | | |
| | Reduction in electrical consumption | See electricity consumption in Table 1 | See Table 1 | See Table 1 | See Table 1 | See table 1 | See table 1 | | |
| | Prairie restoration and natural maintenance | Serigraph | 75 acres | 20 acres | 20 acres | 20 acres | 20 acres | | Land sold to Ozaukee land trust so it will remain preserved |
| | Low VOC coatings to replace conventional ink % | Serigraph P2 | | 63.7% | 60.3% | 70.3% | 78.2% | | Continuing to use more Low VOC inks |
| Environmental management improvement | Number of spill (spills per year) | Serigraph | 2 | 0 | 0 | 0 | 0 | | |
| Environmental management improvement | # of minor EMS non-conformances identified in annual internal EMS audits | Serigraph P2 | N/A | 0 | 0 | 3 | 0 | | Minor procedure updates corrected |

**Table 3: Pollution Prevention Activities Identified and Undertaken**

| Prevention Activities | Year Initiated | Relevant Outcome Measure (Impact on Environment) |
|---|---|---|
| Recycling | 1989 | Increase Recycling measures to reduce landfill |
| Focusing on operational excellence (including identifying and developing low VOC ink systems) | 1997 | Reduce VOC emissions |
| Develop and test alternative ink systems | 2000 | Reduce VOC content per unit of ink used |
| Researching alternative low-VOC solvents | 2003 | Reduce VOC emissions |
| Tested and using low VOC wash solutions | 2003 | Reduce VOC emissions |
| Entered into an interruptible power agreement with WE Energy | 2005 | Reduce Electricity use |
| Installed energy efficient frequency drive motors in the cooling towers | 2005 | Reduce Electricity use |
| Use VOC-free fountain solution in the pressroom | 2005 | Reduce VOC emissions |
| Pumping water used during screen reclamation to bio-filter instead of using fresh water from city | 2006 | Reduce Water use |
| Purchased a power monitoring and energy shed program for building management system | 2006 | Reduce Electricity use |
| Installed energy efficient lighting fixtures throughout plant 2 | 2008 | Reduce Electricity use |
| Replaced de-ionized water in Reliability lab with Reverse Osmosis treated water already available in plant | 2009 | Reduce energy usage |
| Pumping anti-foam into water before bio-filter reservoir instead of after to prevent foam rather than controlling it. | 2010 | Reduce Water use |
| 1. Installed energy efficient lighting in new Fulfillment facility.<br>2. Eliminated salting and plowing of western edge of parking lot which is not used saving 4,500 lbs of salt/yr and preventing runoff.<br>3. Installed additional motion sensors | 2011 | Reduce energy usage<br>Prevent runoff, reduce vehicle emissions<br>Reduce energy usage |
| Installed LED lighting for inspection replacing incandescent in P2 | 2012 | Reduce energy usage, improve ergonomics/safety |
| Added LED parking lot lighting at Specialty plant | 2014 | Reduce energy consumption and improve safety |

| | | |
|---|---|---|
| Joined Strategic Energy Management Team through FOE to identify energy reduction opportunities | 2015 | Reduce energy usage |
| Added LED parking lot lamps at plants 1 and 2 and replaced boilers with energy efficient models | 2016 | Reduce energy usage and improve safety |
| 1. Balanced all jet dryers and on jet dryer 373; modified baffels to even out air flow and thermal mapped each zone to improve heat control.<br>2. Added frequency drives to office room air handlers to reduce energy consumption | 2017 | Reduce energy usage and improve safety |

Significant Environmental Aspects

| Operation | Aspect | Frequency | Severity | Controls | Priority Number (FxSxC) | Legal / Regulatory requirement |
|---|---|---|---|---|---|---|
| Screen Reclaim - Cleaning Screens | VOC generation | 4 | 5 | 2 | **40.0** | DNR Air Permit NR 407; NR 422 |
| Humidity Chamber operation | HAP & VOC reduction | 3 | 5 | 2 | **30.0** | 40 CFR SARA Title 313; DNR Air Permit NR 407, NR 423 |
| Printing, Ink room, Post Printing | Hazardous waste / HAP / VOC generation | 4 | 4 | 2 | **32.0** | NR 661,662 &663; 40 CFR 206-262; DNR Air permit |
| Production / Facility (Electricity and Natural Gas) | Power Consumption | 5 | 3 | 2 | **30.0** | |
| Printing/Post Printing (Cleaning Solvents) | VOC generation | 4 | 3 | 2 | **24.0** | DNR Air Permit NR 407; NR 422 |
| Ink room - Matching Colors (Solvents) | VOC generation | 4 | 3 | 2 | **24.0** | SARA Title 313; DNR Air Permit NR 407, NR 423 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Printing, Ink room, Post Printing | Generation of Recycling material | 5 | 3 | 2 | **30.0** | |
| Sulfuric acid storage | Potential Chemical spill | 4 | 4 | 2 | **32.0** | Tier II; 40 CFR 370 section 312 |
| Hazardous waste storage / Disposal | Potential Hazardous waste spill | 4 | 4 | 2 | **32.0** | RCRA |

Controls for Significant Aspects:

| | |
|---|---|
| Procedure to control VOC reclaim Solvents | SCR-21.734-F |
| Biofilter Abatement plan | ENV-17.004-P |
| VOC Reduction using UV to replace Conventional ink Using Launch Process when possible and / or Bio-filter | SAL - 2.009-P |
| Printing Scrap % of Cost Control | Dashboard |
| Recycling procedure for materials | ENV-17.357-W, ENV-17.357-F |
| VOC Reduction using proper screen reclamation process | SCR-21.353-W |
| Sulfuric acid control and storage procedure | ENV-17.369-W |
| Hazardous waste storage / Disposal process | ENV-17.368-W |
| | ENV-17.371-W |
| VOC cleaning solvents | ENV-17.376-W |

**Significant Aspects Continual Improvement:**

Water removed from FY 2008 due to Water reclamation project

Blue tape removed from FY 2008 due to change in procedures

Procedure to control wipes removed from FY 2008

Lighting system change from metal hyalite to fluorescent to save electricity

De-ionized water replaced with RO water

Implemented on base electronic filing system 2009

Tool cleaning solvent process changed in 2009 to reduce usage

Wipes - Purchasing buys reusable wipes

Water saved by adding de-foamer in chiller room to reduce fresh water usage in 2011

Replaced boilers with energy efficient models and replaced parking lighting with LED in 2016